Space Weather Forecast

Issued on Sunday, 10 December 2023 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further isolated M-flares likely.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate, with two low-level Moderate-flares observed from a wide sunspot region near the southwest limb, with a peak event 10/0353 UTC. This is the most active of ten sunspot regions on the disc, eight of which are numbered. While this has exhibited a decaying trend, it maintains sufficient complexity for the potential for similar flares. The most developmental region is the one approaching the centre disc in the northern hemisphere, with consolidation of its leader spots and ongoing growth in its intermediate regions. No Earth-directed Coronal Mass Ejections (CMEs) were observed in available imagery.

Solar Wind / Geomagnetic Activity: Solar wind speeds were near or at background, declining from around 400km/s to near 350km/s by the end of the period. Total Interplanetary Magnetic Field (IMF) was weak while the important north-south component of the IMF was also weak and variable. Geomagnetic activity was Quiet (Kp 0-1).

Energetic Particles / Solar Radiation: The count rate of energetic particles remained at Background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is forecast with a likelihood of further isolated M-flares, predominately from the sunspot in the southwest which has already been the source of M-flares on 08 and 09 Dec, or the developing region in the north-centre disc.

Solar Wind / Geomagnetic Activity: A weak CME may give a glancing interaction late on day 1 (10 Dec), however this is very low confidence. Otherwise, current background solar winds have the potential to become slightly elevated day 1 and into day 2 (10-11 Dec) due to the onset of any fast wind arrival from a couple of difficult to observe, and therefore low confidence coronal holes. Any enhancement is likely to ease on days 3-4 (12-13 Dec). Quiet geomagnetic activity is forecast to become Unsettled with a spell of Active from any CME enhancement, along with a slight chance of G1 Minor Storm intervals, mainly later day 1 or day 2 (10-11 Dec). Activity then easing to be mainly Quiet with isolated Unsettled intervals late day 2 onward.

Energetic Particles / Solar Radiation: The count rate of energetic particles is forecast to remain at Background with only a very slight chance of rising towards the S1 Minor Radiation Storm threshold given any significant flares from the two largest regions on the visible disc.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	55	50	45
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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